

REMARKS

The Official Action mailed November 8, 2007, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Filed concurrently herewith is a *Request for Continued Examination*. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statement filed on October 20, 2003.

Claims 2-6, 10, 11, 14, 15, 18, 19 and 21-25 are pending in the present application, of which claims 2 and 6 are independent. Claims 4 and 6 claims have been amended to better recite the features of the present invention. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 1 of the Official Action objects to claim 2 regarding an alleged grammatical error. Specifically, the Official Action suggests amending claim 2 by removing "and" after "a switching element formed over the substrate;" (page 2, Paper No. 20061030). The Applicant respectfully disagrees that the inclusion of "and" is a grammatical error. As suggested by the use of single-indentation, in claim 2, a display device comprises a substrate, a pixel portion, a driving circuit, a charge pump circuit, and a charge pump control circuit. As suggested by the use of double-indentation, the charge pump circuit comprises a switching element and a capacitor. That is, the charge pump control circuit is not necessarily included in the charge pump circuit, but is part of the display device. As such, the Applicant respectfully submits that it is not necessary or desirable to amend claim 2 in the manner proposed in the Official Action. Accordingly, reconsideration and withdrawal of the objection is in order and respectfully requested.

Paragraph 2 of the Official Action rejects claim 4 under 35 U.S.C. § 112, second paragraph, noting a lack of positive antecedent basis for "the frequency varying unit." In

response, in claim 4, the Applicant has replaced "the frequency varying unit" with "the clock frequency," which is positively recited in claim 3. The Applicant respectfully submits that amended claim 4 is definite. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 112 are in order and respectfully requested.

Paragraph 3 of the Official Action rejects claims 2-6, 10, 11, 18, 19 and 21-25 as obvious based on the combination of U.S. Patent Application Publication No. 2002/0036636 to Yanagi and U.S. Patent Application Publication No. 2001/0007432 to Ayres. Paragraph 5 of the Official Action rejects claim 14 as obvious based on the combination of Yanagi, Ayres and U.S. Patent Application Publication No. 2003/0011586 to Nakajima. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of independent claim 2. Independent claim 2 recites, among other features, a plurality of pixels over a substrate, a driving circuit over the substrate, a charge pump circuit comprising a switching element over the substrate and a charge pump control circuit over the substrate. By forming a charge pump circuit and a charge pump control circuit over a same substrate as a pixel portion and a driver circuit, power consumption can be reduced (see page 10, lines 15-18), and the number of electronic parts can be decreased so that the manufacturing cost can be reduced. For the reasons provided below, Yanagi, Ayres and Nakajima, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

The Official Action concedes that "Yanagi does not mention the driving circuit, a switching element, nor a charge pump control circuit formed over the substrate" (page 3, Paper No. 20061030). In other words, the Official Action concedes that Yanagi does not teach or suggest forming a charge pump circuit and a charge pump control circuit over a same substrate as a pixel portion and a driver circuit.

The Official Action asserts that a TFT switching array 32 (Figure 4) of Ayres corresponds with an active matrix liquid crystal display, that a diode 10 (Figure 1) corresponds with a switching element, that Figure 1 of Ayres corresponds with a charge pump comprising a switching element, and that an integrated circuit device 31 (Figure 4) corresponds with a charge pump control circuit (Id.). The Official Action asserts that "Ayres modifies the display device of Yanagi by replacing the switching elements with PIN diodes and forming the driving circuit, charge pump circuit, switching element, a charge pump circuit, and a charge pump control circuit on a common substrate" (Id., referring to paragraphs [0007] and [0015]). The Applicant respectfully disagrees and traverses the assertions in the Official Action.

Arguably, Ayres may teach that TFT switching array 32 corresponds with the claimed pixel portion, that charge pump circuit 34 corresponds with the claimed charge pump circuit, that the charge pump circuit 34 comprises the diode 10 and capacitor 12,

and that the pixel region (TFT switching array 32) and the charge pump circuit (charge pump circuit 34) are formed over a common substrate 36. However, the Applicant respectfully submits that Ayres does not teach or suggest that a charge pump control circuit for controlling a charge pump circuit should be formed over the same substrate as a pixel region. The Official Action asserts that that the last two lines of paragraph [0007] of Ayres teach that an integrated circuit device 31 (Figure 4) corresponds with a charge pump control circuit. However, integrated circuit device 31 of Ayres is not formed over the common substrate 36, on which the pixel region (TFT switching array 32) is formed (Figure 4 reproduced below) (see also, paragraph [0045]).

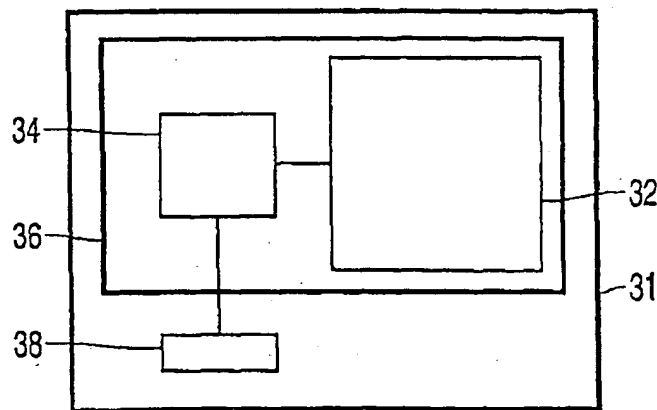


FIG. 4

Further, paragraph [0007] of Ayres describes that a charge pump circuit can be integrated with thin-film circuit elements in an AMLCD, or in integrated control circuitry of a power MOSFET. Therefore, the Applicant respectfully submits that the Official Action has not demonstrated how Ayres teaches or suggests that a charge pump control circuit should be formed over the same substrate as a pixel region.

Therefore, the Applicant respectfully submits that Yanagi and Ayres, either alone or in combination, do not teach or suggest a plurality of pixels over a substrate, a driving circuit over the substrate, a charge pump circuit comprising a switching element over the substrate and a charge pump control circuit over the substrate.

Nakajima does not cure the deficiencies in Yanagi and Ayres. The Official Action relies on Nakajima to allegedly teach the features of dependent claim 14. Specifically, the Official Action relies on Nakajima to allegedly teach an EL display device (pages 7-8, Paper No. 20061030). However, Yanagi and Ayres and Nakajima, either alone or in combination, do not teach or suggest a plurality of pixels over a substrate, a driving circuit over the substrate, a charge pump circuit comprising a switching element over the substrate and a charge pump control circuit over the substrate.

Since Yanagi, Ayres and Nakajima do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.


Paragraph 4 of the Official Action rejects claims 6, 11 and 19 as obvious based on Yanagi. Paragraph 6 of the Official Action rejects claim 15 as obvious based on the combination of Yanagi and Nakajima. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended.

The prior art, either alone or in combination, does not teach or suggest all the features of independent claim 6, as amended. Independent claim 6 has been amended to recite that a variable frequency-dividing circuit and a CPU are formed over the same substrate as a pixel portion, which is supported in the present specification, for example, by Figure 1 and the disclosure at page 6, lines 5-27. The Applicant respectfully submits that Yanagi and Nakajima, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

Since Yanagi and Nakajima do not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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